

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
2 February 2006 (02.02.2006)

PCT

(10) International Publication Number  
**WO 2006/011158 A2**

(51) International Patent Classification:  
**G08G 1/123** (2006.01)

(21) International Application Number:  
PCT/IN2005/000206

(22) International Filing Date: 16 June 2005 (16.06.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
655/MUM/2004 16 June 2004 (16.06.2004) IN

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(81) Designated States (*unless otherwise indicated, for every  
kind of national protection available*): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,

KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA,  
MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ,  
OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL,  
SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC,  
VN, YU, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every  
kind of regional protection available*): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,  
SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,  
GQ, GW, ML, MR, NE, SN, TD, TG).

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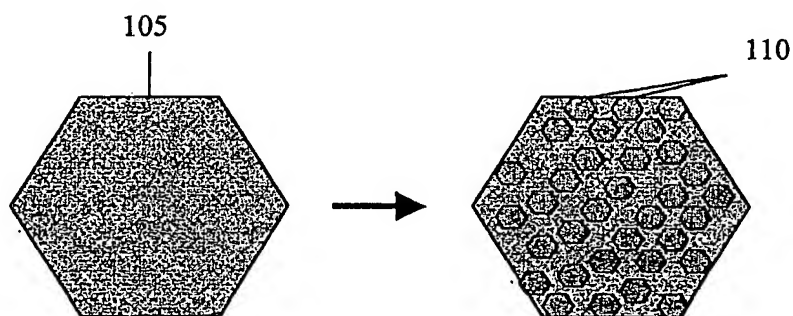
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- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- of inventorship (Rule 4.17(iv)) for US only

**Published:**

- without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A METHOD AND SYSTEM OF INTELLIGENT TRANSPORTATIONS



(57) Abstract: A Method and System of Intelligent Transportation providing faster, safer, cleaner, better returns on travel expenditure, comfortable and convenient means of transportation; and offering "price-levels and choice of service" bundles based fast and frequent feedback of user demand. It combines with unique features such as choice to drive or to ride or to drive / ride alone or with desired / favored group of co-travelers with each choice coupled with incentives and rewards. They can suggest their preferred models of vehicles, and their expected travel time etc. that is accommodated within the service level agreements for the subscription level. The system is enabled with navigation assistance, novel approach to incident management, efficient and economical fuelling and vehicle repair and maintenance system, vehicles driven by proficient drivers, traffic management approach to match traffic volume to carriage capacity of road network, etc. The System involves classification of road network for different types and means of commuting, and classification and design of vehicles for effective and efficient operation in the system.

**A Method and System of Intelligent Transportation**

By

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Chandra Vikash

10

**Field of the Invention**

The present invention is in the field of transportation and pertains more particularly to a method and system of transportation thus providing effective and efficient traffic management, and giving a consumer complete travel experience according to their choice along with other related services.

20

**Background of the Invention**

Customers today have a choice for a product / service in respect of food, clothes, housing, etc. at its microest level. Customers, however, do not have a similar choice in the field of transportation and travel services, for e.g., a choice for a vehicle, with a choice for an infrastructure and with a choice for an environment. Even the company that sells the highest premium segment car, for e.g., does not provide a high quality travel experience that extends beyond the vehicle.

Ideally, in the filed of transportation, three aspects are to be looked into i.e. vehicles, infrastructure and environment, to properly cater to the consumers' need of choice. The consumer would ideally want to choose within options in different areas such as, for e.g., walking / cycling / motorbikes / scooters / automobile; vehicle - rentals / lease – chauffeur or self-driven; rickshaw / taxicab / bus/ train, etc., along with other mobility options such as carpooling, car sharing, ridesharing, etc. In respect of goods

transportation, options include enabling the consumer to carry the goods with him or in carts, small and large lorries, trailers, wagon trains, etc.

In the field of transportation of people and or goods over short and long distances,  
5 there are significant wastes. In a systemic view, these wastes in the known system of transportation, originates from in-congruencies in the following areas, such as:

1. Traffic volume and carriage capacity of the road section;
2. Traffic flow expectation and vehicle driving quality;
- 10 3. Vehicle seating capacity and vehicle occupancy;
4. Vehicle location and passenger / goods location;
5. Vehicle optimal speed range – fuel efficiency, safety, depreciation - and vehicle speed in traffic conditions;
6. Vehicle model / features and consumer preferences;
- 15 7. Usage scenarios depicted in advertisements and actual usage scenarios;
8. Vehicle obsolescence – psychological, technological and economic;
9. Recyclability and modularity of a vehicle, sub-assemblies and components for reuse;
- 20 10. Vehicle characteristics – weight, optimal speed range, tyre characteristics, ground clearance - and road surface;
11. Vehicle and infrastructure design and accessibility requirements for elderly, children and for disabled;
12. Travel time expectation and vehicle speed;
13. Repair and maintenance complexity of vehicle (compounded by increase  
25 electronic / software components) and Information available to private vehicle owners;
14. Supply and demand of road network;
15. Supply and demand of parking stations;
16. Supply and demand of vehicle fuels – Petrol, Diesel, CNG, LNG, Bio-fuel,  
30 Hydrogen Fuel Cell, Electric, Solar, Compressed Air, Hybrid etc.;

17. Fueling point - location, time, appropriate fuel type and vehicle location and information available to private vehicle owners;
18. Vehicular pollution and environment's absorption capacity;
19. Traffic signal times and traffic flow;
- 5 20. Price points for available service and consumer's willingness to pay;

It should be noted that the undesirability of these wastes is from a consumer point of view even as some of these in-congruencies are exploited by vested interests for value appropriation. Examples are:

- 10 1. Lack of appropriate infrastructure and environment for walking and cycling in densely inhabited areas for short trips. This encourages escalating use of automobile for these trips which are not suitable for the purpose i.e. as density of automobile use in the area increases more people feel unsafe to walk or cycle and switch to automobiles;
- 15 2. Safety perception in case of uneven collision with a heavier vehicle leads to escalation in size and weight of automobiles;
- 20 3. Lack of transparency in prices for proprietary replacement parts, optional fittings, and whether a specific component or sub-assembly needs to be replaced;
- 25 4. Lack of transparency in fuel brands which claim mileage and vehicle-life enhancing benefits and the appropriate fuel type for a vehicle;

Existing approaches focus on one hand on packing more strength and features on the vehicle:

- 30 a. Greater safety and security for the occupant – more metal protection around the vehicle, airbags, emergency response etc.;

- b. Communication for navigation assistance, concierge to find a location or reach there by a less congested route etc.;
- c. Online information – stock quotes, weather updates etc. while traveling and while they are stuck in traffic jams.

Alternatively, known methods either focus on the infrastructure alone such as creating more roads, flyovers or my framing more stringent traffic rules.

- 10 Another prevailing approach is to circumvent the problem by focusing on mass rapid transit solutions such as underground metro or high capacity bus as a panacea. Even though they are useful on the high-density corridors, their capital cost is high for wider deployment, looking at various factors such as the cost of land acquisition, digging underground in built-up areas in an entire Region and the traffic disruption they cause
- 15 during their long construction phase. In such a case, they fail to provide door-to-door mobility and to entice commuters away from their private vehicle.

- Many urban areas have poly-nucleated development with high dispersion of inhabited areas. Overall, though this approach is a useful complement, it distracts attention from
- 20 the larger problem of the need for a comprehensive approach.

- The above approaches fail to take a systemic view of vehicle-infrastructure-environment elements and the need for an integrated solution for traffic management coupled with consumer choice and satisfaction.

- 25 In light of the limitations in the prior art it has occurred to the inventor that a systemic solution for providing better transportation, traffic management and consumer travel choice is needed.

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### **Object of the Invention**

One of the objects of this invention is to provide efficient transportation services and  
5 complete travel experience to a consumer according to their choice, preferences and  
affordability.

Another object of this invention is to manage the traffic in such a fashion, which causes  
less traffic congestion, assures consumers of the travel time, road-safety, etc.  
10

Another object of this invention is to facilitate and enhance the mobility of the  
consumers or their goods but simultaneously better and efficiently utilizing the  
available energy resource for such mobility.

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### **Brief description of the Drawings**

Fig. 1 is a diagram illustrating classification of Land according to the embodiment of  
20 the present invention.

Fig. 2 is a diagram illustrating the laying and classification of the road network  
according to an embodiment of the present invention.

25 Fig. 3 is a diagram illustrating the Expressway-Over-Bridge constructed at the  
Expressway – Street Intersection in accordance with the present invention.

Fig. 4 is a diagram illustrating the structure of an Expressway Station according to the  
embodiment of the present invention.

30

Fig. 5 is a diagram illustrating the Light & Slow Vehicles (“LSVs”) Port constructed  
according to embodiment of the present invention.

A Flow Chart illustrating the operation of the System in accordance with the embodiment of the present invention.

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### **Description of the Invention**

The present invention provides method and system for providing seamless, door-to-door mobility services for people and for goods for short and long distances at market-mimicking price points.

The inventor provides a unique method and system of intelligent transportation to provide efficient transportation service; complete travel experience to a consumer according to their choice and preferences; manage the traffic in such a fashion, which causes less traffic congestion, assures consumers of the travel time, road-safety, etc. The method and System of the present invention are described in enabling detail below.

### **Classification of the Land Area:**

#### **Layout of the Region and Village/s:**

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The layout of the Regions and Village(s) in accordance with the present invention can be explained and illustrated with reference to Fig. 1.

According to the present invention, the entire given land 100 under implementation is classified as a Region 105. According to the present invention a Region 105 could be, for example and without limitations, any urban area, rural area, province, country or even a continent. As per the preferred embodiment of the present invention, a given Region 105 should be an area identified on the basis of parameters such as, for e.g. but

without limiting, the area within which a significantly large majority of surface trips begin and terminate.

5 According to the embodiment of the present invention, in a given Region 105, certain geometrically shaped Villages 110 are formed. As per the preferred embodiment of the present invention, however, and for the purposes of implementing the present invention effectively, Villages 110 should be the areas in the given Region 105 identified on the basis of parameters such as, for e.g. but without limiting, the places where majority of trips begin and terminate. Further, according to the preferred embodiment of the  
10 present invention, the Villages 110 should be formed in a hexagonal shape (honeycomb).

According to the preferred embodiment of the present invention, Villages 110 are inhabited areas in a given Region 105 and each Village 110 is normally made up of 4  
15 to 8 sq. kilometers. A Village 110 can also be made up of an area either more than 4-8 sq. kilometers or less than 4-8 sq. kilometers and hence the said distances specified herein should not be seen as a limitation. The area of the Village 110 may also vary depending upon the preferences of the implementers on criteria such as, for e.g., population density in that area and its identity as a single community, etc. and hence  
20 the said distances specified herein should not be seen as a limitation.

#### **Laying and Classification of the Road Network:**

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The layout of the Road Network in accordance with the present invention can be explained and illustrated with certain appropriate figures.

#### **Expressways:**

30

The layout of the Expressways 115 in accordance with the present invention can be explained and illustrated with reference to Fig. 2.



According to the embodiment of the present invention, the Villages 110 formed in accordance with the present invention are bound or connected by interconnected Expressways 115 in any appropriate manner. According to the preferred embodiment of the present invention, the Villages 110 are bound or connected by Expressways 115 on various sides. For the purposes of the preferred embodiment of the present invention in respect of how Villages 110 are bound by Expressways 115, please refer to the illustrated Fig.2.

According to the present invention, Expressways 115 are multi-lane carriageways with exclusive access to Fast and Heavy Vehicles ("HFVs"), for e.g. but not limiting to, cars, vans, buses and trains, and which are further described below in the embodiment of the present invention. According to the present invention, Railways - elevated, surface or underground - are also classified as Expressways 115 in this definition.

According to the embodiment of the present invention, an Expressway 115 gives access only to motorized HFVs. As per the preferred embodiment of the present invention, proper known means for obstructing trespassers, animals, etc. should be along the side-line of the Expressways 115 to avoid these problems. Known means such as construction of walls or fences along the side-line of the Expressways 115 could be used. According to the present invention, the speed limit on the Expressways 115 could be determined after taking into consideration factors including the type of vehicles used on the Expressways 115, safety, etc. According to the preferred embodiment of the present invention, the speed limit on the Expressways 115 could be around 90 kilometers / per hour. The specified speed limit is only an indicative figure and should not be seen as a limitation.

30

**Streets:**

The layout of the Streets in accordance with the present invention can be explained and  
5 illustrated with reference to Fig. 2.

According to the embodiment of the present invention, a Village 110 so formed in  
accordance with the present invention comprises of roads and pathways called as  
Streets 120 laid in any desired manner. According to the preferred embodiment of the  
10 present invention, the Village 110 comprises of interconnected Streets 120 laid in a  
way to create a mesh of Streets 120 in the said Village 110. For the purposes of the  
preferred embodiment of present invention in respect of laying Streets 120 in a Village  
110, please refer to the illustrated Fig.2.

15 According to the embodiment of the present invention, Streets 120 are multi-lane  
carriageways for Light and Slow Vehicles (“LSVs”) and includes dedicated lanes for  
pedestrians called as Pathways. LSVs include, for e.g. but without limitation, could be  
pedestrians, bicycles, very low to zero –pollution scooter, motorcycles, manual or  
electric rickshaws, golf-carts, etc., and which are further described below in the  
20 embodiment of the present invention.

According to the present invention, the speed limit on the Streets 120 could be  
determined after taking into consideration factors including the vehicles used on the  
Streets 120, the objects of the invention including using fast, safe and non polluting  
25 vehicles on the Streets 120, etc. According to the preferred embodiment of the present  
invention, however, the speed limit on the Streets 120 could be around 30 kilometers /  
per hour. The specified speed limit is only an indicative figure and should not be seen  
as a limitation. They optimize space with option for multiple rules – right side  
motorized, free overtaking. Lanes can be reserved for a particular class of vehicles e.g.  
30 bicycle lane and their width can be customized.

Exceptions to allow HFVs to ply over the Streets 120 can be made possible only in the case of emergencies such as inclement weather conditions with prior intimation through means for street alarm system, for e.g., blinking light indicators, sounds, etc.

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**Road Network Infrastructure Details:**

The Road Network Infrastructure details in accordance with the present invention can  
10 be explained and illustrated with appropriate figures.

**Expressway-Street Intersection:**

The layout and the details of the Expressway – Street Intersection in accordance with  
15 the present invention can be explained and illustrated with reference to Fig. 3.

According to the embodiment of the present invention all Expressways 115 in a given Region 105 are interconnected. One or more Expressways 115 may also intersect with Streets 120. At such intersection known means in the industry can be provided to  
20 facilitate consumers plying on the Streets 120 to cross the Expressways 115.

According to the preferred embodiment of the present invention, an Expressway Over-Bridge (“EOBs”) 130 is provided for facilitating the consumers including people and bicycles to crossover the Expressways 115 at such intersection with the aid of staircase, escalators or elevators for upward or downward movements. The EOBs 130 could also  
25 be adapted, with necessary modifications, to facilitate the consumers to cross the Expressways 115 under the Expressways 115. According to the preferred embodiment of the present invention, whether the EOBs 130 are to be provided over the Expressways 115 or under the Expressways 115 are determined taking into consideration factors including the topography or the geography of the surrounding  
30 area.

Although the EOBs 130 can be powered by traditionally known energy sources, however, according to the preferred embodiment of the present invention, the EOBs 130 are powered by non-conventional energy sources such as solar sheds, batteries, fuel cells, etc.

5

According to the preferred embodiment of the present invention, at such intersection, in case EOBs 130 is so provided according to the present invention facilitate the consumer to cross the Expressways 115 over the Expressway 115, the EOBs 130 are to be elevated to a height sufficient enough to allow the tallest vehicle that could pass through the Expressway 115. Known technological ways and means could also be adapted to increase or decrease the elevation level of the EOBs 130 at such intersections.

10

According to the present invention, by providing EOBs 130 at such intersections, a grade separated intersection of Streets 120 and Expressways 115 is provided.

15

#### **Street-Street Intersection:**

According to the preferred embodiment of the present invention, all Streets 120 in a Village 110 are interconnected. Combined with the EOBs 130 all Streets 120 are seamlessly connected for pedestrians and for bicyclists.

20

#### **Expressway Stations:**

25

The layout and the details of the Expressway Station 135 in accordance with the present invention can be explained and illustrated with reference to Fig. 4.

According to the embodiment of the present invention, as stated earlier, all Expressways 115 in a given Region 105 are interconnected and may intersection each other. According to the embodiment of the present invention, Expressway Stations 135, which are described more in detail below in the embodiment of the present

30

invention, are typically constructed at such intersections. According to the preferred embodiment of the present invention, Expressway Stations 135 are generally constructed at an elevated level in such a way that it allows incoming HFVs to pass through. According to the embodiment of the present invention, Streets 120 may also terminate at the Expressways 115. However, according to the preferred embodiment of the present invention Streets 120 terminate at Expressway Stations 135. Further, although Expressway Stations 135 can be constructed at such intersections according to the implementers choice, however, according to the preferred embodiment of the present invention, Expressway Stations 135 are typically located at every of 5 -8 kms. The specified distance herein i.e. 5-8 kms. is only an indicative figure and should not be seen as a limitation. Further, Railway stations in the Region 105 are also classified as Expressway Stations 135.

According to the present invention, Expressway Station 135 is a multi-storied building comprising of multi-level parking, vehicle fueling and servicing facility for HFVs. The Expressway Stations 135 also further comprise of facilities for other commercial establishments such as, but not limiting to, office space, retail space, hotels, business centers and transit warehouses, etc.

According to the embodiment of the present invention, the multi-level parking facility may provide for known methods for facilitating parking of HFVs. According to the preferred embodiment of the present invention, however, the multi-level parking facility can be provided to comprise one or more Multi-Level Parking Structures ("MLPS") 160. According to the preferred embodiment of the present invention, each such MLPS 160 can be so designated to stock a specific dimension of HFVs. For the purposes of the preferred embodiment of present invention in respect of MLPS 160, please refer to the illustrated Fig. 4. Further, according to the preferred embodiment of the present invention, such MLPSs 160 can be provided with means for upward and downward movement, including elevators, of the HFVs in a direction that suits the implementer's choice.

Although there are known methods that could be implemented for aiding parking of the HFVs in the multi-level parking facility, parking of the HFVs is preferred, according to the embodiment of the present invention, to be provided for with the aid of a ramp.

- 5 According to the present invention, at each story of the Expressway Station 135, provision or means for charging the HFVs are provided. According to the preferred embodiment of the present invention, such provisions or means for charging can be provided in such a manner that each HFVs are connected to a power grid to receive or to send electrical power as required.

10

According to the present invention, the parking facility provided at the Expressway Stations 135 also comprise multiple fueling points for various fuel sources and types, and carriers fuels such as gasoline, hydrogen fuel cell, electric, bio-fuels, etc.

- 15 According to the present invention, the Expressway Stations 135 are also equipped with designated areas for fueling / servicing for any type of HFVs.

**Light and Slow Vehicle ("LSV") Ports:**

- 20 The layout and the details of the LSV Port in accordance with the present invention can be explained and illustrated with reference to Fig. 5.

According to the preferred embodiment of the present invention, and as discussed earlier in the embodiment, all Streets 120 in a Village 110 are interconnected.

- 25 According to the present invention, at intersections including Street-Street intersections, or Street-Expressway intersection or even at an Expressway Station 135, typically, a port called as an LSV Port 165 is constructed. Such LSV Port 165 may be at a ground level (compared to the surrounding area) or at an elevated level, depending upon the implementer's choice. Although according to the present invention LSV Port
- 30 165 are typically located at every street corner or at intersections, according to the preferred embodiment of the present invention, an LSV Port 165 should be located

such that at least one LSV Port 165 is located within walking distance from any inhabited area.

5 According to the present invention, LSV Port 165 are equipped with energy sources for facilitating energy to the LSVs. According to the preferred embodiment of the present invention, however, LSV Port 165 are covered with plastic solar sheets, which are wired to charge LSVs, as required.

10 According to the present invention LSVs Ports 165 also provide for parking LSVs. According to the embodiment of the present invention, any known means for providing parking can be provided. However, the preferred method for providing parking at the LSV Port 165, according to the embodiment of the present invention, is by providing racks of dimensions suitable for accommodating LSVs including bicycles, golf-carts, etc.

15

**Classification of the Vehicles:**

20 According to the embodiment of the present invention, vehicles to be used in the present invention are classified under two categories i.e. Light and Slow Vehicles ("LSVs") and Heavy and Fast Vehicles ("HFVs").

25 **Light and Slow Vehicles:**

30 According to the embodiment of the present invention, LSVs are very low to zero emission vehicles, which ply on Streets 120. LSVs are further characterized as manual driven / automated guided vehicles- pedestrians, bicycles, very low to zero-pollution scooter, motorcycles, manual or electric rickshaws, golf-carts, etc. According to the present invention, LSVs have low acceleration and a low peak speed. According to the preferred embodiment of the present invention, LSVs should have a low peak speed of

about, but without limiting to, 30 km / hr. According to the present invention, LSVs typically use combination of human solar and electric power to directly power the vehicles or solar sheds, which charge batteries, which in turn power such vehicles.

**5 Heavy and Fast Vehicles:**

According to the embodiment of the present invention, HFVs are motorized heavy and fast vehicles, preferably having low to zero emission levels, such as cars, buses, etc  
10 running typically on Fuel Cell, CNG, or HSD. HFVs ply on the Expressways 115 and are suited for long distance travel. According to the present invention, HFVs, generally, move from one Expressway Station 135 to another, with zero or very few stops. According to the present invention, HFVs can have varied capacities. According to the preferred embodiment of the present invention, however, HFVs  
15 should be of a size and shape with a view to optimize road space. Further, according to the preferred embodiment of the present invention, HFVs are typically having capacities between 4 to 40.

**20 Controlling Systems:**

According to the present invention, in a given Region 105, a central information hub called as a Central Information Center ("CIC") is established for providing and  
25 handling issues comprising of registration, issue and service of consumer membership / user cards; facilitate enquiry, information, booking and reservation for a near trip or a far trip; central display of all vehicles including HFVs and LSVs in the Region 105 and or Village 110, data processing for the purposes of determining a driver proficiency rating (DPR), route determination and dispatch, transfer of HFVs amongst Expressway  
30 Stations 135 based on demand, traffic signal control, traffic violation and incident management; handling the traffic in the given Region 105 or Village 110 and incidental



matters and information thereto, etc. According to the present invention, the CIC can be also be assigned such other responsibilities as per the implementer's choice.

5 According to the present invention, the CIC will possess, contain, store and process all information / data relevant for the transportation services provided by the Service Provider, which is the subject matter of the present invention, and would further utilize it to provide efficient transportation services, coupled with complete travel experience to a User according to their choice, preferences and affordability, who also face less traffic congestion, and are assured of their travel time, road-safety, etc.. The system  
10 facilitates and enhances the mobility of the consumers or their goods but simultaneously better and efficiently utilizing the available energy resource for such mobility.

15 According to the present invention, the functions or the services rendered / delivered by the CIC can also be performed or delivered with the aid of various channels including establishing one or more local counters at various public and desired locations.

20 According to the preferred embodiment, however, the functions to be performed, and the services to be delivered, by the CIC, can be bifurcated or handled by separate centers performing respective functions as may be assigned. The preferred details are as under:

**Regional Transportation Information Center:**

25 According to the present invention, for a given Region 105, a Regional Transportation Information Center ("R-TIC") is established for providing and handling issues comprising of registration, issue and service of consumer membership cards; facilitate enquiry, information, booking and reservation for a near trip or a far trip, etc. According to the present invention, communication between the R-TIC and the

consumer can be effected through any communication mediums. Further, according to the present invention, the functions or the services rendered by the R-TIC can also be performed or delivered with the aid of various channels including establishing local counters at various public and desired locations.

5

**Regional Traffic Control Station:**

According to the present invention, for a given Region 105, a Regional Traffic Control Station ("R-TCS") is established for the purposes of handling the traffic in the given  
10 Region 105 and incidental matters and information thereto. According to the present invention, R-TCS performs such functions and looks into issues including central display of all HFVs in the Region 105, data processing for the purposes of determining the Driver Proficiency Rating ("DPR"), route determination and dispatch, transfer of HFVs amongst Expressway Stations 135 based on demand, traffic signal control,  
15 traffic violation and incident management, etc.

For determining DPR the parameters include close adherence to the navigation plan, lane, target speed, direction, etc. Any deviations are recorded and the report generated is sent to the R-TIC at the end of the trip. The payment to the User-Driver varies with  
20 the DPR. There may be more than one user possessing the DPR, who are willing to drive. Users bid for the driving assignment and the User with the highest DPR gets the assignment. In situations, where no User qualifies, a staff driver is assigned for the trip.

25 According to the present invention, the R-TCS can also be assigned such other responsibilities as the implementer may choose to.

**Village Traffic Control Station:**

According to the present invention, for a given Village 110, a Village Traffic Control Station ("V-TCS") is established for the purposes of handling the traffic in the given Village 110 and incidental matter and information thereto. According to the present invention, V-TCS performs such functions and looks into issues including handling central display of all LSVs in the Village 110, transfer of LSVs amongst LSV Port 165 based on demand, traffic signal control, traffic violation and incident management, etc. According to the present invention, the V-TCS can also be assigned such other responsibilities as the implementer may choose to.

**System Operation:**

The operation of the system can be illustrated with the aid of a flow chart.

**Payment Modes and Plans:**

According to the present invention, a User can avail of the transportation service, which is the subject matter of present invention, of the Service Provider by various modes comprising of subscription mode, per-trip mode, validity mode, etc. Similarly, according to the present invention, a User can be given an option to pay for the services based on the criteria including the nature of the trip i.e. near trip or a far trip, etc. Similarly, according to the present invention, a User can be provided with various plans for availing of the services of the Service Provider for e.g. Value Plan, Platinum Plan, Gold Plan, Silver Plan, Economy Plan, etc. Additionally, the User can further be given plans for availing the services of the Service Provider based on the Vehicles that they may choose to use for e.g. a high subscription rate for a HFVs, etc. According to the present invention, a User is also given the option for post-paid mode of payment or pre-paid mode of payment, for the purposes of availing the service. Additionally,

according to the present invention, a pre-paid card can also be made available for a visitor User who seeks to avail of the service.

#### **Communication with Central Information Center:**

5

According to the embodiment of the present invention, a User communicates with the CIC (and includes R-TIC, R-TCS or V-TCS as the case may be, hereinafter collectively called as CIC) of the Service Provider with communication means such as telephone, Internet, kiosks, etc. According to the preferred embodiment of the present invention, a communication device is to be made available inside the given Vehicle (including LSVs or HFVs or otherwise) for better communication between the User with the CIC and avail of the phenomenal navigational / transportation services provided by the Service Provider. Additionally, according to the preferred embodiment of the present invention, communication devices can and should also made available at appropriate public places (closed or open) and or at desired places according to the implementer's choice, for the User. Additionally, according to the preferred embodiment of the present invention, a User, who may be an illiterate person, also has an option of communicating with the CIC and availing the services of the Service Provider by visiting a local counter of the CIC opened by the service provider for those purposes.

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According to the present invention, the CIC possesses, contains, stores and processes all information / data relevant for the transportation services provided by the Service Provider, which is the subject matter of the present invention, and would further utilize it for providing efficient transportation services, coupled with complete travel experience to a User according to their choice, preferences and affordability; manage the traffic in such a fashion, which causes less traffic congestion, assures User of the travel time, road-safety, etc.; facilitates and enhances the mobility of the User or their goods but simultaneously better and efficiently utilizing the available energy resource

25

for such mobility.

According to the present invention, a routine or a frequent User can also set default settings of the information relevant for availing the services. According to the present  
5 invention, thus, a routine or a frequent User can customize his travel information for a specific customizable itinerary.

#### **Near Trip and Far Trip:**

10 According to the preferred embodiment of the present invention, a travel i.e. starting point to the destination point, of a User is categorized into two i.e. Near Trip ("NT") and Far Trip ("FT"). According to the preferred embodiment of the present invention, a NT is a trip, which is typically less than 5 kms. The specified distance herein i.e. 5  
15 km. is only an indicative figure and should not be seen as a limitation. In certain situations, depending upon the Service Provider's choice, the distance to classify a trip as an NT can be more than 5 kms. According to the preferred embodiment of the present invention, a NT is typically made only on Streets 120 with the aid of LSVs. However, in certain situations, for e.g., emergency, transportation of goods, etc., a NT can be made with the aid of HFVs.

20

According to the preferred embodiment of the present invention, a Far Trip ("FT") is a trip, which typically exceeds 5 kms. The specified distance herein i.e. 5 km. is only an indicative figure and should not be seen as a limitation. In certain situations, depending upon the Service Provider's choice, the distance to classify a trip as a FT  
25 can be more than 5 kms. According to the present invention, a FT is typically a trip between two Expressway stations 135 with no stops at a High Value Plan to very few stops at a Lower Value Plans. According to the preferred embodiment of the present invention, a FT is broken down into a NT from the origin point to the assigned Expressway Station 135; a FT between the assigned Expressway Stations 135 and

another NT to the end point. According to the present invention, such breaking down of a FT into two NTs and a single FT makes the User pay on the actual use basis.

5 According to the present invention, in case a User intends to halt in between his journey, he may specify the same accordingly. The User may specify various information of his choice including a hotel or restaurant when he intends to halt or while breaking his journey may opt to walk for a specified distance for pleasure purposes or for health purposes before resuming his further journey, etc.

10 According the preferred embodiment of the present invention, the operation of the System can be illustrated with the aid of the followings steps along with the illustrative flow chart.

Step 0:

15

The User registers himself with a Service Provider. He chooses from amongst a variety of subscription plans like Platinum, Gold, Silver or Economy, etc., at multiple price points. Service levels such as maximum travel time; vehicle models, telematic services etc., are defined for each subscription plan. Within a specific plan a User can  
20 also make preferences about seating arrangement, drive or ride option, list of favored co-travelers, list of telematic services etc., and the mode of payment. A User can update its subscription plan, preferences with prior notice.

A User can make payments by a pre-paid or post paid mode. In post-paid modes,  
25 monthly bills are dispatched to the User. Options to pay by cheque, cash, or electronic payments are also available.

Visitors in the Region 105 are issued short duration, pre-paid Member Smart cards. The balance upon completion of their stay is refunded in person or delivered to the visitor address.

- 5 All Users have to produce authentic photo-identity proof at the time of registration, which are subsequently verified by the Service Provider.

Upon completion of registration process, a User receives a Member Smart card, which stores detail about their identity. The User subscription details are stored at the CIC.

10

Step 1:

- A User communicates to the CIC for information, buying tickets or making reservations with the aid of any communication means such as phone, computer, kiosks, etc. The User may also avail of the services of the Service Provider manually by visiting any of the local counters opened by the Service Provider for such purposes. They may also set a default option for a routine travel, in which case they need to communicate in case of change in their travel plan.

20 Step 2:

A User specifies his nearest starting point from the available choices and the destination details for e.g. the area, street address, landmark etc.

25 Step 3:

A User receives a confirmation of their request and information like boarding location, vehicle number, and seat number about their booking for each segment of their journey. A User can take note of the information or print this e-ticket. At local

counters, a User receives a paper ticket. A User has to carry his Member Smart Card for their identification.

**Other Features:**

5

According to the present invention, a User along with providing transportation services is also provided with other advantages and services including travel time assurance, road-safety, etc.

10 **Travel Time Assurance:**

According to the present invention, the User can be provided with various services and methods, to assure the User of the travel time, the services comprising, for e.g., compensated the User for loss of the time, etc. According to the present invention,  
15 with fewer vehicles and an optimal mix of vehicles of different sizes, the traffic flow is predictable in this system. According to the present invention, a User can set as default settings, according to his preferences and needs, and using a combination of traffic control measures, information including individual vehicle speeds, etc.

20 **On-Road Safety and Security:**

According to the present invention, a User is provided better vehicle and passenger safety and security. With fewer vehicles, fewer drivers are needed. Additionally, according to the preferred embodiment of the present invention, the CIC collects,  
25 preserves and processes data pertaining to driving information of a User. The said information is utilized by the Service Provider for assigning a rating for a User-Driver called as a Driver Proficiency Rating ("DPR"). Accordingly, the present invention, as preferred, identifies better drivers and offers them the choice and incentives to drive from amongst those who travel on the same route. According to the present invention,



as preferred, the higher DPR, higher compensation is to be paid to such User-Driver. Additionally, according to the present invention, the Service Provider can also monitor Vehicles for their roadworthiness. According to the preferred embodiment of the present invention, with the aid of the CIC, the Service Provider is enabled location and  
5 remote management of vehicle in case of emergency.

#### **Road Quality Service Assurance:**

According to the present invention, Users pay for using the road (Expressways 115,  
10 Streets 120, or otherwise) for the number of miles that they ride at a rate that closely reflects their consumption of the road infrastructure and allied services. In this way, according to the present invention, good quality roads, their upkeep and maintenance, and availability of road space based on demand, is made available to the User.

#### **15 Clean Environment Assurance:**

According to the present invention, with fewer vehicles on roads, pollution is reduced. As every vehicle carries more people than earlier, the present invention provides for vehicle upkeep and upgrade to cleaner fuels and / or vehicle technologies. This  
20 facilitates faster absorption and commercialization of alternate fuel technologies and vehicles such as hybrids, fuel cells, solar-electric, bio-fuels etc. Hence, through the present invention, Users are thus assured of clean air services for stretches where User may choose to walk (for health reasons) or need to walk in areas where there is no motor vehicle access.

25

#### **Favoured Co-Traveler Service:**

According to the present invention, Users can choose whether they want to travel alone or select their favored co-traveler. For these purposes, they can create a list of people

or Users can enter profiles of people; they want to travel with. According to the preferred embodiment of the present invention, the favored co-passenger list is approved with mutual consent. According to the present invention, the favoured co-passenger list can be edited, updated by the Users.

5

**Portability:**

According to the present invention, User can also avail of personalized services in other Region 105 where this system is implemented.

10

**Environment Friendly:**

By implementing this present invention, air-conditioning in vehicles becomes redundant except in extremely hot or cold conditions and for vulnerable Users. This is due to various reasons including the pollution –emission and dust levels significantly decrease.

15

**Healthy and Wholesome:**

By implementing this present invention, in a wholesome approach to the User's overall needs, they can choose to walk or bicycle comfortable distances in a pedestrian-friendly environment that is included in the overall travel experience.

20

**Freedom: Choice to Ride or to Drive, No Refueling, Repair or Maintenance:**

25

According to the present invention, Users are given freedom to choose when to drive and when to travel as a passenger. According to the present invention, with this freedom, if they like driving and qualify as a good driver i.e. their Driving Proficiency Rating is above a threshold level, they can earn for their service to the system.

Alternatively, according to the present invention, they can just take a ride, with the comfort that the driver has been selected by the system to provide a safe ride.

According to the present invention, Users do not have to take vehicles for refueling.

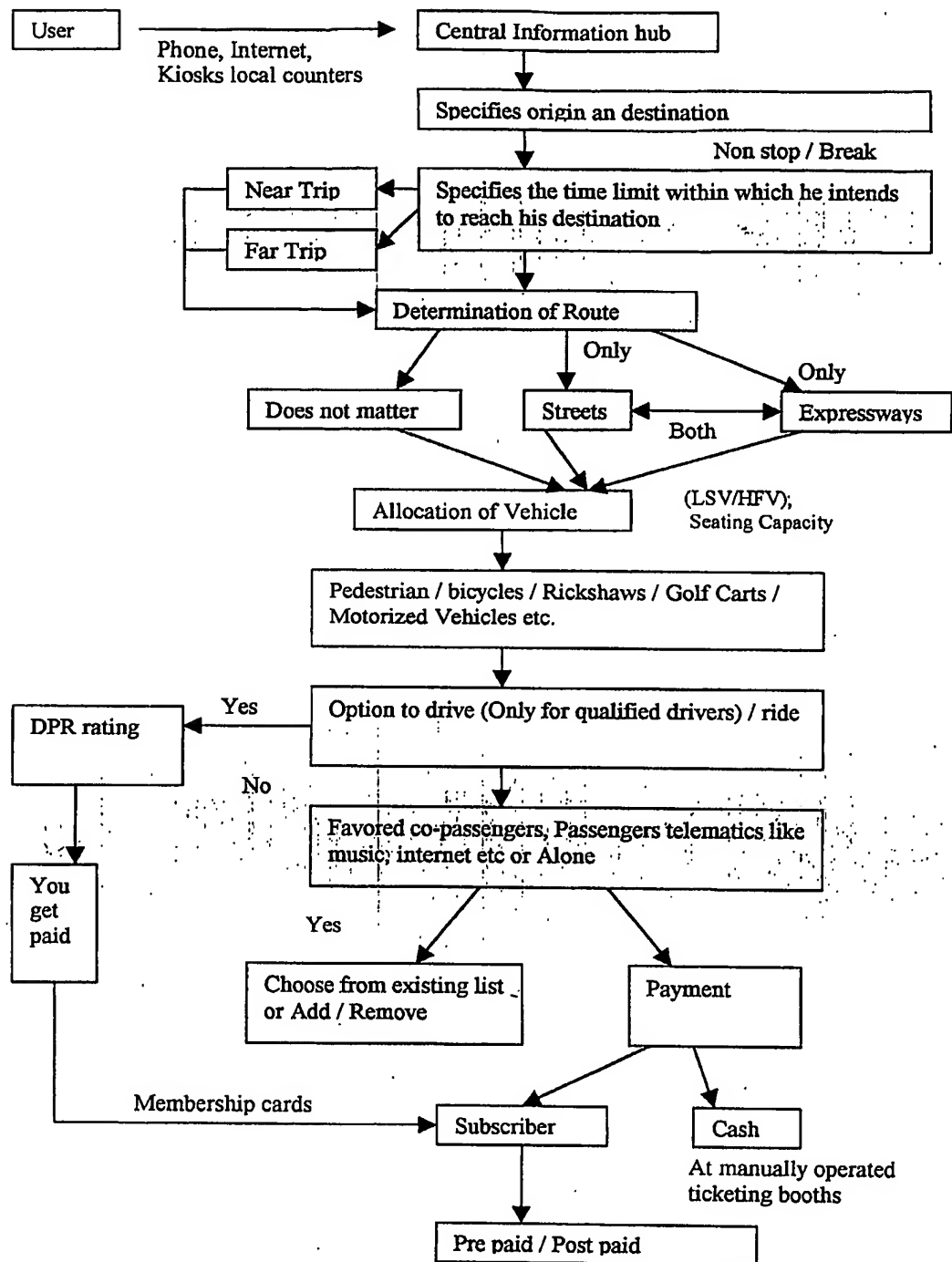
- 5 According to the preferred embodiment of the present invention, the Service Provider can constantly monitor the vehicle including the fuelling, performances, etc. This minimizes the chances of a vehicle break down. Further, according to the preferred embodiment of the present invention, the Service Provider in situations like for e.g. break downs, accident, etc. promptly arranges for an alternate vehicle to reach the point
- 10 of incidence, hospital, etc. as the case may be. According to the present invention, the Service Provider also provides for handling of insurance issues.

15

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**I Claim:**

1. A method and system of intelligent transportation comprising of:  
Classification of a given land area;  
5 Laying and classifying road network in the given land area;  
Classification of vehicles;  
A central information hub being means for aiding transport management and related services; and  
A means for locating vehicles and their communication with the central  
10 information hub.
2. A method and System of Intelligent transportation as claimed in claim (1) wherein the given land is classified into Regions based on parameters including the area within which significantly large majority of surface trips begin and terminate.  
15
3. A method and System of Intelligent transportation as claimed in claim (1) wherein the said Region is further divided into Villages based on parameters including the area within which majority of surface trips begin and terminate.
- 20 4. A method and System of Intelligent transportation as claimed in claim (1) wherein the said Village has a honeycomb-like (hexagonal) shape.
5. A method and System of Intelligent transportation as claimed in claim (1) wherein the said Village is formed based on the population density in a given area.  
25
6. A method and System of Intelligent transportation as claimed in claim (1) wherein the said Village is formed based on identity as a single community.

7. A method and System of Intelligent transportation as claimed in claim (1) wherein the said Village is formed based on a specified area and is spread over an area of 4 to 8 kilometers.
- 5 8. A method and System of Intelligent transportation as claimed in claim (1) wherein the road network comprises of a combination of streets and expressways.
9. A method and System of Intelligent transportation as claimed in claim (1) wherein the said Villages are bound by expressways.
- 10 10. A method and system of intelligent transportation as claimed in claim (1) wherein the said expressways are multi-lane carriageways with exclusive access to Fast and Heavy Vehicles.
- 15 11. A method and system of intelligent transportation as per claim (1), wherein means for obstructions are constructed along the sidelines of the expressways.
12. A method and system of intelligent transportation as per claim 1, wherein the speed limit for a particular on the expressways is determined after taking into  
20 consideration factors including the type of vehicles used on the expressways, safety.
13. A method and System of Intelligent transportation as claimed in claim (1) wherein the said Villages comprise of interconnected Streets.
- 25 14. A method and system of intelligent transportation as claimed in claim (1) wherein the said Streets are multi-lane carriageways with exclusive access to certain vehicles and include dedicated lanes for pedestrians.

15. A method and system of intelligent transportation as per claim (1), wherein the speed limit on the Streets is controlled taking into consideration specified factors.
16. A method and system of intelligent transportation as claimed in claim (1) wherein  
5 the said Streets optimize space with option for multiple rules including lanes being reserved for a particular class of vehicle.
17. A method and System of Intelligent transportation as claimed in claim (1) wherein  
10 the all expressways are interconnected.
18. A method and System of Intelligent transportation as claimed in claim (1) wherein  
at such intersection of street and expressway, Expressway-Over-Bridge is provided  
as means for crossing the expressway. That provides for a grade-separated  
intersection with expressway.  
15
19. A method and System of Intelligent transportation as claimed in claim (1) wherein  
Expressway Station is built at sites, amongst where expressways intersect such that  
one Expressway is located at every of 5 -8 kms.
20. A method and System of Intelligent transportation as claimed in claim (19) wherein  
20 at Expressway Stations are constructed at an elevated level in a way that it allows  
incoming Heavy and Fast vehicles to pass through.
21. A method and System of Intelligent transportation as claimed in claim (19) wherein  
25 such Expressway Stations are located at a suitable distance as per the  
implementer's choice;
22. A method and System of Intelligent transportation as claimed in claim (19) wherein  
such Expressway Station facilitates multitasking activities including multi-level

parking, vehicle fueling, servicing facility, and or other commercial establishments including offices, retailers, hotels, warehouses, and or business centers.

23. A method and System of Intelligent transportation as claimed in claim (22) wherein  
5 the said multi-level parking structures are designated to stock a specific dimension of vehicle.

24. A method and System of Intelligent transportation as claimed in claim (22) wherein  
10 the said multi-level parking structures are provided with means for upward and downward movement of the vehicles in a direction that suits the implementer's choice.

25. A method and System of Intelligent transportation as claimed in claim (22) wherein  
15 the said multi-level parking structures are provided with a ramp for aiding entry and exit in the parking facility.

26. A method and System of Intelligent transportation as claimed in claim (19) wherein  
20 at such Expressway Stations means for supplying energy sources for the vehicles are provided in such a manner that vehicles are connected to power source to receive or to send power.

27. A method and System of Intelligent transportation as claimed in claim (19) wherein  
25 at such Expressway Stations multiple fueling points for various fuel sources and types are provided.

28. A method and System of Intelligent transportation as claimed in claim (1) wherein  
the road network intersect at a given point including street-street intersection, or street-expressway intersection or even at an expressway station where a street may terminate.



29. A method and System of Intelligent transportation as claimed in claim (28) wherein at such intersections, a street port is built or at an intermediate point such that one street port is available within walking distance from any inhabited area.
- 5
30. A method and System of Intelligent transportation as claimed in claim (29) wherein the said port is equipped with various energy sources for the vehicles.
31. A method and System of Intelligent transportation as claimed in claim (29) wherein the said port is covered with photovoltaic panels, which are connected to provide charging to the vehicles.
- 10
32. A method and System of Intelligent transportation as claimed in claim (29) wherein the said port provides means for parking vehicles.
- 15
33. A method and System of Intelligent transportation as claimed in claim (32) wherein the parking in the port is provided with the aid of racks of dimensions suitable for accommodating vehicles.
- 20
34. A method an System of Intelligent transportation as claimed in claim (1) wherein the classification of the vehicles are made as Light and Slow Vehicles ("LSVs") and Heavy and Fast Vehicles ("HFVs").
35. A method and System of Intelligent transportation as claimed in claim (34) wherein Light and Slow Vehicles ("LSVs") are very low to zero emission vehicles and only ply on streets and have low acceleration and a low peak speed of about 30 kms / hr.
- 25
36. A method and System of Intelligent transportation as claimed in claim (34) wherein Heavy and Fast Vehicles ("HFVs") are motorized heavy and fast vehicles running on various energy sources.
- 30

37. A method and System of Intelligent transportation as claimed in claim (34) wherein Heavy and Fast Vehicles ("HFVs") are motorized heavy and fast vehicles running on a various energy sources and having a low to zero emission levels and are used mostly to ply on expressways, except certain situations.
38. A method and System of Intelligent transportation as claimed in claim (34) wherein Heavy and Fast Vehicles ("HFVs") have varied sitting capacities.
39. A method and system of intelligent transportation as claimed in claim (34), wherein the Light and Slow Vehicles ("LSVs") are used for near or short trips and the Heavy and Fast Vehicles ("HFVs") are used for far or long trips.
40. A method and System of Intelligent transportation as claimed in claim (1) wherein the central information hub is a Central Information Center aiding transportation management and related services.
41. A method and System of Intelligent transportation as claimed in claim (40) wherein the Central Information Center provides and handles transportation management comprising of providing and handling various issues such as registration, issue and service of user membership cards, facilitate enquiry, information, booking and reservation for a near trip or a far trip; central display of vehicles in the area, data processing for the purposes of determining the driver rating, route determination and dispatch, transfer of vehicles amongst various routes based on demand, traffic signal control, traffic violation and incident management; handling the traffic in the given area and incidental matters and information thereto.
42. A method and System of Intelligent transportation as claimed in claim (40) wherein the Central Information Center possesses, contains, stores and or processes all

information and or data relevant for transportation management and related services.

43. A method and System of Intelligent transportation as claimed in claim (40) wherein  
5 the Central Information Center possesses, contains, stores and or processes all  
information and or data relevant for transportation management and related services  
and utilizes it for providing efficient transportation services, coupled with complete  
travel experience to a user according to their choice, preferences and affordability,  
manage the traffic in such a fashion, which causes less traffic congestion, assures  
10 consumers of the travel time, road-safety, etc, facilitates and enhances the mobility  
of the consumers or their goods but simultaneously better and efficiently utilizing  
the available energy resource for such mobility.
44. A method and System of Intelligent transportation as claimed in claim (43) wherein  
15 the Central Information Center provides and handles transportation management by  
itself or through its local counters.
45. A method and System of Intelligent transportation as claimed in claim (1) wherein  
the means of positioning and communication with the central hub is made available  
20 inside a given vehicle.
46. A method and System of Intelligent transportation as claimed in claim (1) wherein  
means of communication for a user is also made available at appropriate public  
places and or at desired places according to the implementer's choice.  
25
47. A method and System of Intelligent transportation as claimed in claim (1) wherein  
a user can customize his travel information for a specific customizable itinerary.
48. A method and System of Intelligent transportation as claimed in claim (1) wherein  
30 a user pays for the transportation service based on various payment modes, value

plans, vehicles, post-paid periodic billing, pre-paid, debit account and or by any combination thereof.

49. A method and System of Intelligent transportation as claimed in claim (1) wherein  
5 a travel route of a user is classified into categories comprising of a Far Trip and a Near Trip.

50. A method and Systems of Intelligent transportation as claimed in claim (1) wherein  
10 a far trip is typically a trip between two expressway stations with no stops to very few stops.

51. A method and Systems of Intelligent transportation as claimed in claim (1) wherein  
15 a near trip is within a Village, to adjoining villages or from an origin point inside a Village to an assigned expressway station.

52. A method of transportation comprising the following steps:  
a. Communication of choices of travel by a user to the said central hub by  
communication means such as type of vehicle etc.;  
b. Specifying the origin and/or destination ( in certain cases the origin may be  
20 automatically communicated;  
c. Specifying the time limit within which the user intends to reach his  
destination;  
d. Specifying whether the user intends to drive the said vehicle or needs a  
professional driver or opts for self drive;  
25 e. Specifying whether the user intends to travel alone or otherwise choose his  
co-travelers from the available list of specific categories of travelers, or  
preferred co-traveler's list, which can be further altered by adding,  
removing co-travelers.;  
f. Specifying passenger telematics like music, Internet, etc.;

- g. Receiving a confirmatory message containing information like boarding location, vehicle number, and seat number.

53. A method of transportation as claimed in claim (52) wherein a user may be also  
5 assisted manually with the aid of local counters opened for those purposes.
54. A method of transportation as claimed in claim (52) wherein the selection of a road network is done by the service provider according to the other specified choices.
- 10 55. A method of transportation as claimed in claim (52) wherein a user is given a driving proficiency rating.
56. A method of transportation as claimed in claim (52) wherein a user is can drive the said vehicle if he possesses a satisfactory driving proficiency rating and the same is  
15 higher than other co-travelers who have made the option to drive.
57. A method of transportation as claimed in claim (52) wherein a user is paid by the service provider if the user drives a vehicle along with the co-travelers in proportion to their driving proficiency rating.  
20
58. A method of transportation as claimed in claim (52) wherein a visitor opting for a prepaid card is refunded the balance amount on the completion of his stay.  
25

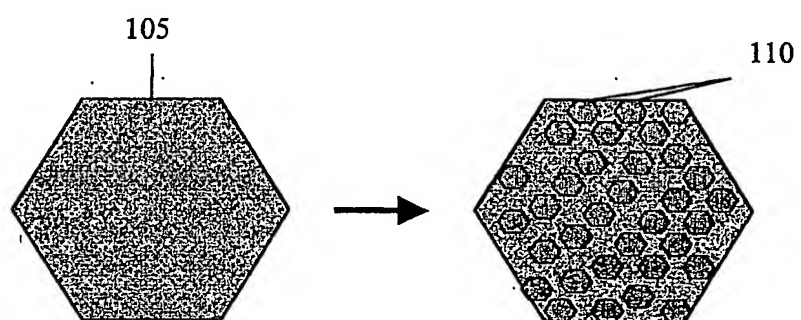
**Figure 1**

Figure 2

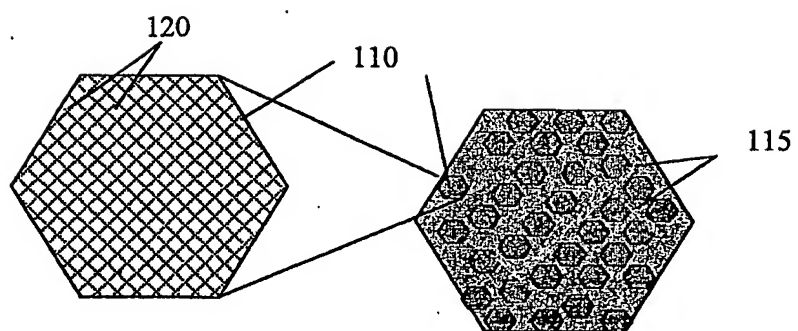


Figure 3

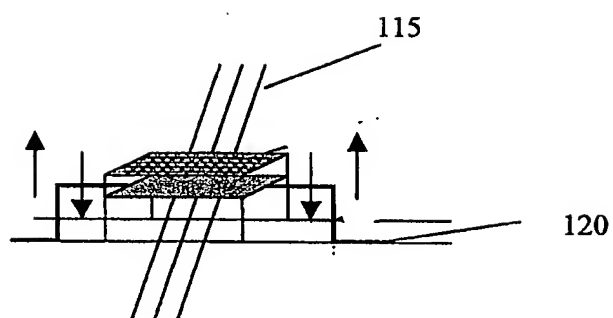




Figure 4

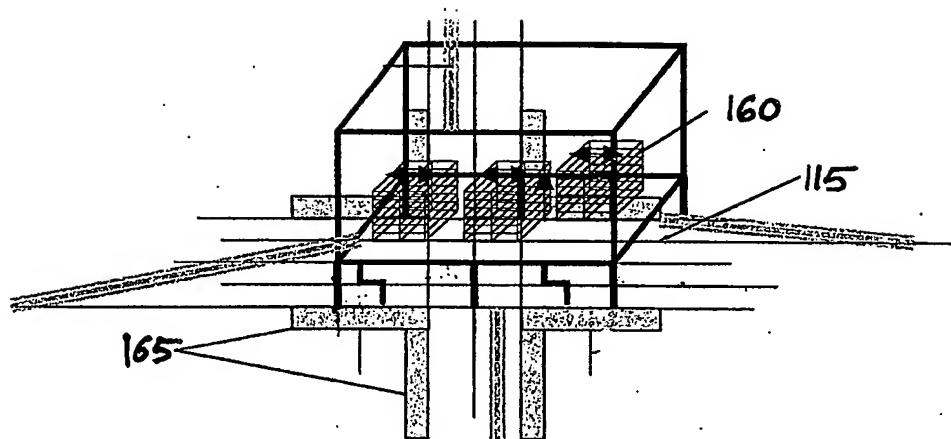


Figure 5

